MARSH

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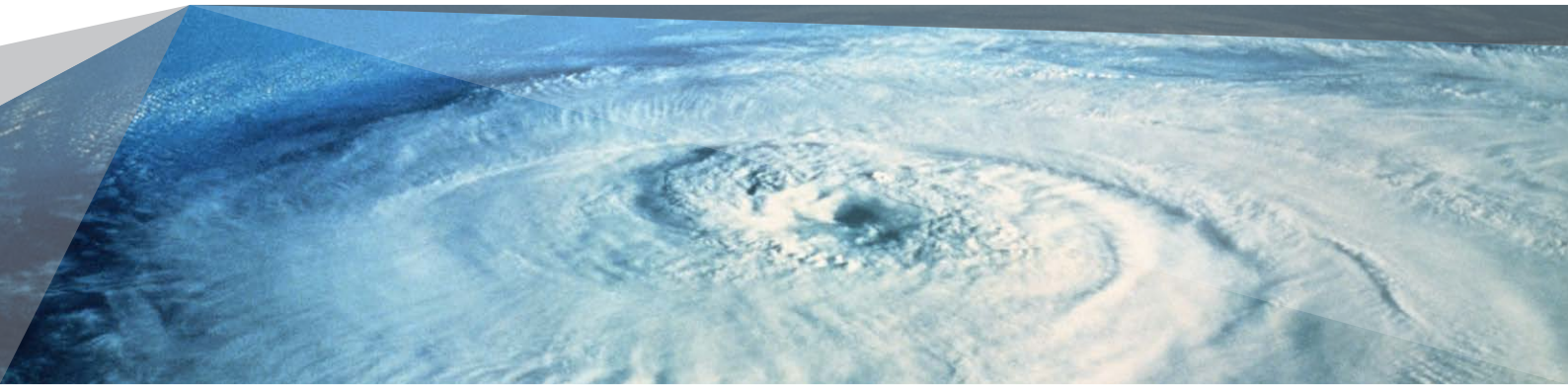
NATURAL CATASTROPHES: SAFEGUARDING BUSINESS CONTINUITY WITH ADVANCED PLANNING



Natural disasters can affect vast areas and impact all businesses that operate in the vicinity, many of which may be interdependent. It is this reliance on supply chains that can severely affect a business's ability to get back up and running following a natural catastrophe. In this document we use Hurricane Harvey as a case study to understand how supply chains can be affected and demonstrate the need to plan in advance for disruptive events to safeguard business continuity.

KEY IMPACTS

After hitting Texas on Friday, August 25, Hurricane Harvey disrupted all aspects of the energy value chain in the state, with impacts including:

- Platforms in the Gulf of Mexico were shut down and more than100[1] platforms were evacuated in advance of the approach of the hurricane. The Gulf of Mexico produces around 17%[2] of US crude oil. Hurricane Harvey reduce the production of oil and gas by around 20%[3]. In addition, oil tankers bringing crude from elsewhere were unable to unload due to port closures[4].
- Around 45% of US refining capacity is located on the Gulf Coast, with more than 20% concentrated in the Corpus Christi, Houston-Galveston, and Beaumont-Port Arthur areas[5] of Texas. The refineries in these areas shut down in advance of the hurricane[6], while other Gulf Coast refineries shut down or reduced production either in preparation for the storm or due to crude shortages. In total, it is estimated that US refining capacity was reduced by 30%.
- The Texas and Louisiana coastline is at the center of US ethylene and propylene industry, with around 70% of ethylene and 90% of propylene being produced and consumed in the area[7]. As a result of Harvey, many producers of polyethylene and polypropylene have declared *force majeure* situations. This reduced supply the of plastics to industries across the US in the following weeks[8].
- The Houston metropolitan area is a low-lying coastal plain with clay-based soils and a high concentration of tarmacked and concreted ground. This can lead to rapid runoff from rainfall and intense localized flooding. As a result, roads were blocked by floodwater, abandoned vehicles, and debris, which caused significant delays for employees commuting to work and delivery of critical supplies.
- Many stores and fuel stations were shut down due to shortages and the inability to move available goods through the flood water[9].

All of the above examples illustrate how the business continuity of an energy company can be impacted, and highlight some key considerations for minimizing business interruption.

BUSINESS CONTINUITY PLANNING CONSIDERATIONS

In order to minimize the impact of wide-area events such as hurricanes, it is necessary for organizations to investigate and review their supply chain prior to a loss. Where multiple similar businesses are located in the same area, consideration should be given to the types of events that could significantly reduce overall supply or demand.

When considering the possible impact of such events, businesses in the energy industry are faced with a key risk management challenge: Should they accept a guaranteed loss by taking actions such as shutting down for several days, or perhaps stockpile crude or other products at the expense of cash flow?

Below, we examine key considerations for maintaining business continuity in the event of a hurricane and minimizing possible losses.

IDENTIFY POSSIBLE SUPPLY CHAIN FAILURE POINTS

An important factor in business continuity planning is identifying single points of failure. Businesses often initially focus on critical points or aspects of resilience within their control, such as a single crude distillation unit (CDU) or critical safety system such as a flare at a refinery or petrochemical site. However, they should also consider the critical parts of their supply chain which lie outside of their direct control. This could include a single manufacturer of catalyst, a single customer for one product, or a reliance on a third-party air separation unit or power unit.

Hurricane Harvey demonstrated why this may not be adequate. Although the Gulf of Mexico produces around 1.7 million barrels of oil per day[10] - which may seem adequate to support a refinery that produces a quarter of a million barrels per day even after a loss event - the wide-area impact of a hurricane, the time needed to evacuate, and the risk associated with a staffed, operating rig means this may not be the case.

In addition, Hurricane Harvey had a significant effect on logistics. The reduction in refinery capacity also impacted the supply of diesel and resulted in widespread shortages, which constrained the movement of key workers to get and bulk goods by road and rail.

MULTIPLE SUPPLIERS MAY BE AFFECTED

A wide-area event may impact other supply options that would typically be considered as mitigation. For crude oil, this may include oil tankers stranded offshore, due to port closures and the pipeline networks that are dependent on power from the grid or pumping stations being located in low-lying flood exposed areas.

Alternate suppliers (and/or customers) need to be reviewed to determine if the supply (or customer demand) is on a single node. This occurs when all suppliers are exposed to the same loss event.

Geographic specialization has long been a trend in the energy industry, as oil and gas are distributed in pockets around the globe, and the currently accessible reserves are further concentrated. The energy centers and industrial cities present a concentration of opportunity and risk. While the concentration of risk has not yet been fully tested, there are examples from other industries which foreshadow the impact that a wide-area loss could have on an area with a high concentration of energy facilities.

For example, consider a Texas-based ethylene purchaser located outside of the hurricane damage area. Given that there are many ethylene producers located in and around Houston, the purchaser could have made an assessment to establish that, even following the shutdown of all producers in a single flood plain, there would still be adequate capacity to produce the ethylene required for the purchaser. However, such an analysis is unlikely to be able to predict accurately the change in demand from competitors.

CONTRACTS CAN EXACERBATE OR MITIGATE THE EXTENT OF A FINANCIAL LOSS

Only when the resulting impact on the market and the supply chain are fully understood can an informed decision be made about how to mitigate the risk. Careful structuring of commercial contracts with suppliers could potentially ensure the purchaser has first refusal of the remaining ethylene production. Back-to-back contracts could also offer partial mitigation if they are structured to ensure that any penalty clauses in contracts with customers are waived in the event of the feedstock supply being interrupted. A practical step that could be taken would be to have a buffer stock of product at a remote location, so that supply to customers could be maintained even if operations are interrupted.

In this example, following a substantial reduction in ethylene production, one could expect that prices would rise. Such effects could be short-term if producers are only shut down temporarily as a precautionary measure. Long-term effects could occur if a substantial portion of the production capacity were to remain out of service while rebuilds or major repairs were undertaken. Whether the pricing effects would be local, regional, or global would depend on the extent of the capacity affected and the ability of the market to rebalance.

PRICES WILL FLUCTUATE AS A RESULT OF CHANGES IN DEMAND

Price spikes will impact the margins and profitability of businesses up and down the supply chain, and while some businesses will benefit and others will suffer. It is feasible that the margins may fall so low that the operation is spending more money than it makes. Good risk management practice evaluates both possibilities so that the business is ready to exploit positive market conditions and survive negative ones.

DISASTER UNCERTAINTY NEEDS TO BE CONSIDERED

Even with advanced forecasts, the uncertainty of hurricane and flood warnings brings an added challenge to business continuity planning in affected areas. A decision will therefore need to be made prior to the event. In order to maximize effectiveness, it may be necessary to shut down facilities and begin storm preparations as early as possible. Frequently, it is unclear at this stage how severe the event will be, or even if it will occur at all, for example, if the hurricane makes a sudden turn out to sea or if rainfall amounts are much lowered than predicted.

BUSINESS INTERRUPTION INSURANCE CONSIDERATIONS

Events such as Hurricane Harvey provide stark reminders of the importance of reviewing what is and isn't covered under business interruption insurance. In order to be effective, the risk management process must evaluate the business impact of wide-area events and then consider how their insurance would respond.

Most energy facilities spend considerable resources evaluating the worst case loss scenarios for property insurance, commissioning valuation reports, attending risk engineering surveys, and conducting siting surveys for new facilities or projects. However, fewer spend as much time evaluating the financial consequences or supply chain disruption. A study of major insurance losses demonstrates that the BI component of the losses is often higher than the property component [11]. This pattern holds even though many BI exposures are found to be under-declared and under-insured following a loss.

Although BI can be covered under a BI policy, there is a wide range of terms and conditions in the market, and businesses should pay close attention to policy wordings to understand what is covered and what is excluded. The differences between policies can be subtle, and it is therefore essential to know what remaining exposure will fall to the business. The risk management processes can inform the insurance purchasing process, and the provision of insurance can inform the understanding of the net risk management.

It should also be kept in mind that some interruption to the business is not covered by insurance, such as short-term losses, losses that occur due to uninsured perils, or business changes that result from market events and not physical damage.

In some cases, risk managers may decide not to insure contingent risks. However, they should make sure they have a full understanding of the risks in the system and the mitigation available, including all critical nodes, and single points of failure should be evaluated, including the suppliers of suppliers, common logistics, and geographic accumulation of suppliers or customers. This is important, as many insureds only discover the extent of the supply chain risk following interruption, at which point it is too late to purchase the correct insurance.

CONCLUSION

The high concentration of oil and gas assets in the area affected by Hurricane Harvey emphasizes the risk of disruption the energy industry faces from such catastrophic and wide-reaching events. As the energy industry focusses its attention on minimizing disruption from Hurricane Harvey, it should also consider actions to lower future losses and address the significant risks that may still lie ahead.

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